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FUNGI EMPLOYING MUCILAGINOUS HYPHAL, SESSILE, OR STALKED GLOBOSE CELLS TO ENTRAP NEMATODES.

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Development of mucilaginous globose cells on hyphae (Fig. 1) might well be the first step in specialization of hyphae to facilitate entrapment of nematodes and small invertebrates as a source of fungal nutrition. Such traps, which are called lethal lollipops by some investigators, are not uncommon in Florida soils.

Characterization of the trapping device: Globose cell traps come in a variety of shapes predominated by the short stalked globose cell (Fig. 1-C,J). Some trapping cells have an elongate stalk with a very small head (Fig. 1-I) as in Acaulopage pectospora Drechs. Some are bifurcate as in Arthrobotrys pauca McCulloch (Fig. 1-G), others are borne on short, stout stalks as in Monacrosporium mammilatum (Dixon) Cooke and Dickinson (Fig. 1-E), or have elongate, thin stalks as in M. lysipagum (Drechs.) Subram. (Fig. 1-H). Some forms lack stalks and appear as sessile cells (Fig. 1-A, D, F). Sessile cells are found in M. robustum McCulloch, M. phymatopagum (Drechs.) Subram. and Pedilospora dactylopaga Drechs., a fungus that attacks rhizopods. Occasionally, a globose cell will develop on top of another globose cell (Fig. 1-B). Globose cells are also formed on short stalks directly on conidia as in Dactylella asthenopaga Drechs. (Fig. 2-A,C), D. leptospora Drechs. (Fig. 2-D), and Monacrosporium parvicollis (Drechs.) Cooke & Dickinson (Fig. 2-B). Dactylella haptospora Drechs. is the only species in which globose cells are borne on conidia while attached to the conidiophore.

Trapping Function: Nematodes that make contact with a globose cell (Fig. 3-A) become affixed to the cell by a mucilaginous secretion that increases in quantity as the nematode struggles vainly to free itself. An infection peg from the globose cell penetrates the integument of the nematode (Fig. 4) and forms a post penetration bulb within the host that immobilizes the host. Haustorial branches emanating from the post infection bulb penetrate all parts of the host body. Following assimilation of the body contents, hyphal branches penetrate the host integument and grow into the adjacent substrate where globose traps or conidiophores (Fig. 1-K) and conidia (Fig. 1-L) develop.

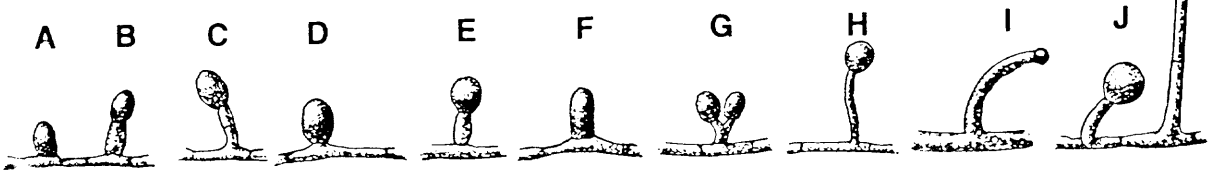

Figure 1, Globose cell types: Sessile; A, D, F, Sessile 2-celled B, Stalked; short stalked E, G, J, stout stalked E, long stalked H, I, bifurcate, G; Conidiophore: K, Conidia L.

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Some species of globose cell fungi also produce trapping devices differing in form and function to that of the globose cells. Non-constricting trapping rings (Fig. 3-B) are produced by Dactylaria candida Drechs., Dactylella asthenopaga, D. leptospora Drechs., and Monacrosporium lysipagum. Monacrosporium cianopagum (Drechs.) Subram. produces a three-dimensional trapping network in addition to sessile trapping cells. Nineteen species of fungi (Table 1) produce globose trap cells. Spores representative of each species are shown in Fig. 5.

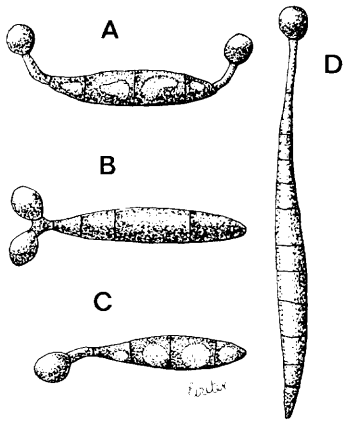

Figure 2. Globose cells borne on conidia. A, C. Dactylella asthenopaga, B. Monacrosporium parvicollis, D. Dactylella leptospora (redrawn from Drechsler).

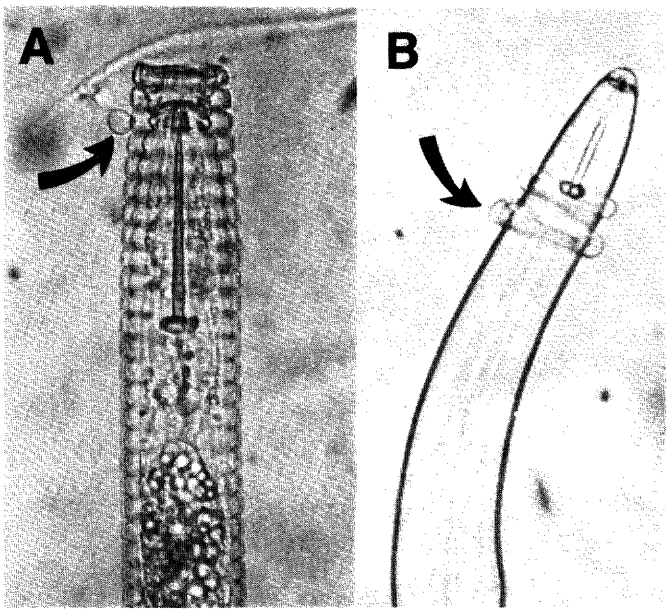

Figure 3. A globose cell attached to the head of Hemicriconemoides wessoni (Arrow). B. Non-constricting rings around the neck region of Helicotylenchus sp. (Arrow).

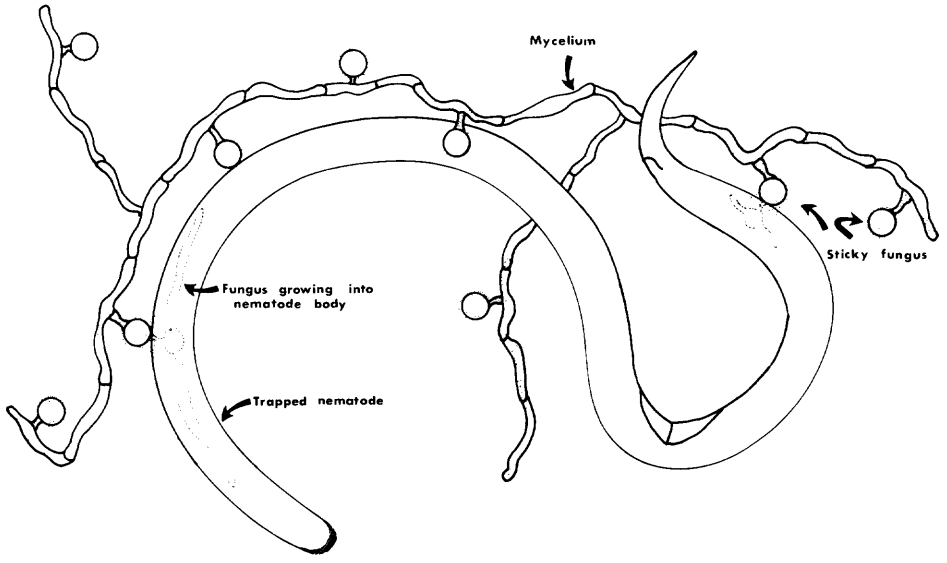

Figure 4. A nematode entrapped by adhesion to globose cells.

Table 1. Species of fungi producing mucilaginous knobs.

Species	Fig. 5	Reference
Acaulopage pectospora	(A)	9
Arthrobotrys pauca	(B)	11
Dactylaria candida	(C)	4
D. haptospora	(D)	5
D. haptotyle Drechs.	(E)	6
D. sclerohypha Drechs.	(F)	6
Dactylella asthenopaga	(G)	4
D. lobata Duddington	(H)	10
D. leptospora	(I)	4
Monacrosporium cianopagum	(J)	6
M. ellipsosporum (Grove) Cooke & Dickinson	(K)	4
M. drechsleri (Tarjan) Cooke & Dickinson	(L)	13
M. lysipagum	(M)	4
M. mammilatum	(N)	2
M. mutabilis Cooke	(O)	1
M. parvicollis	(P)	8
M. phymatopagum	(Q)	7
M. robustum	(R)	11
Pedilospora dactylopaga	(S)	3

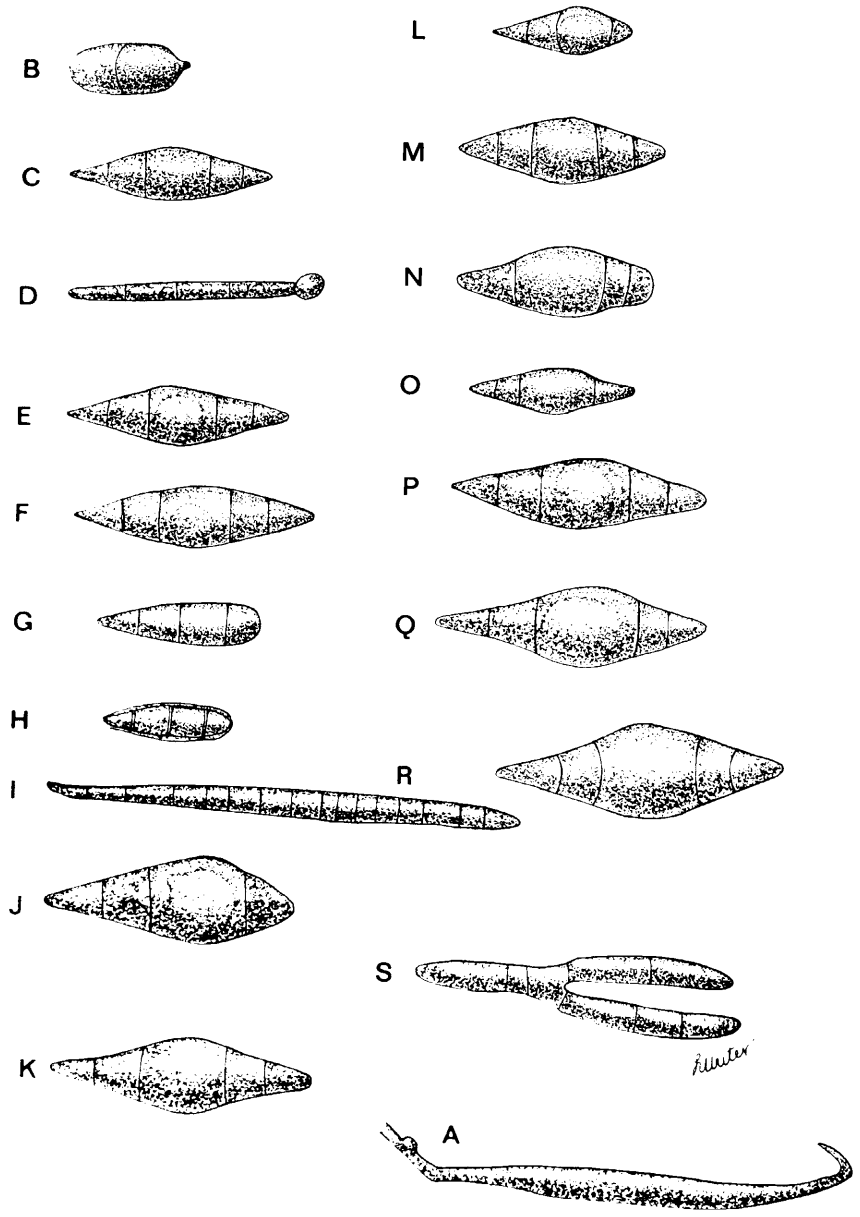

Figure 5. Globose cell fungi: conidial types. (See table 1 for matching species). A, C, D, E, F, G, I, J, K, M, P, Q, S redrawn from Drechsler; B, R redrawn from Duddington; O redrawn from Cooke; N redrawn from Dixon, and L redrawn from Tarjan.

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